3.9.6 Data Mover

The IST user can manage files using the Data Mover window. The user may select multiple files to be sent to multiple locations including EOC and IST sites. There are 3 options for managing files: send, receive and delete.

The user can choose a 1 or more files to be sent to a destination, received from a specified location or deleted from a local directory. The user can select a source directory from the list of available directories provided. This list will also include directories that are identified by subject (i.e., Am-1 Reports). The user can also select the location of files to be sent or received from the list of available locations provided.

A list of available files corresponding to the source directory selected will be displayed. If the send option is selected, the user can select files to be sent to multiple destinations. If the receive option is selected, the user can select files to be placed into a local directory. If the delete option is selected, the user can select files to be deleted from a local directory.

The Data Mover window provides a message area to display the status of the file transfer. Status messages will indicate successful completion, errors, or working progress.

3.9.7 Time Selector

The time selector is a utility and will be used in many different areas of the FOS user interface whenever the user needs to specify time values. Components such as off-line analysis, historical tables or graphs, the replay controller, and event display will use the time selector to specify a single time, a pair of start and stop times, or a time interval. The time selector utilities consists of three windows : the single time selector, the pair time selector, and the interval time selector.

The single time selector (Figure 3.9.7-1) allows a user to select a time by entering an absolute time, or by pressing the event button to enter an orbit number and selecting a event type.

The pair time selector (Figure 3.9.7-2) allows a user to select a start time and a stop time. The start and stop times can be absolute times, relative times, orbital events, or based upon a duration. Pressing the event button allows the user to enter an orbit number and select an event type. The duration may be specified by the number of seconds, minutes, hours, days, or orbits.

The interval time selector (Figure 3.9.7-3) allows a user to select the activating time, the ending time/duration, and the frequency. This interval time is used to specify a standing order. A user may enter the activating time and the ending time or the activating time and the duration. The user also selects the standing order frequency. The frequency may be specified as every number of contacts, orbits, hours, days, weeks, or months.

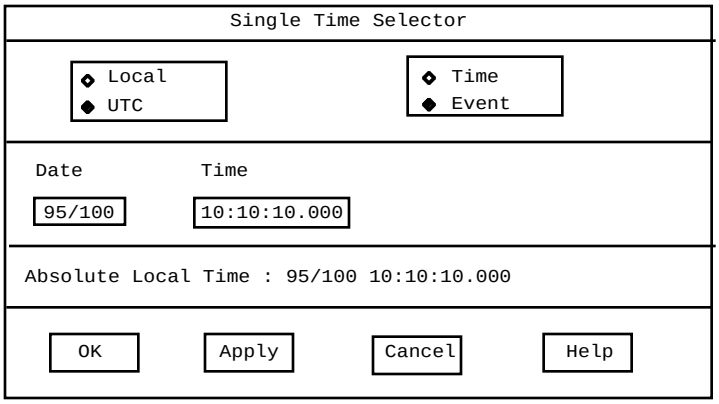

Figure 3.9.7-1. Single Time Selector

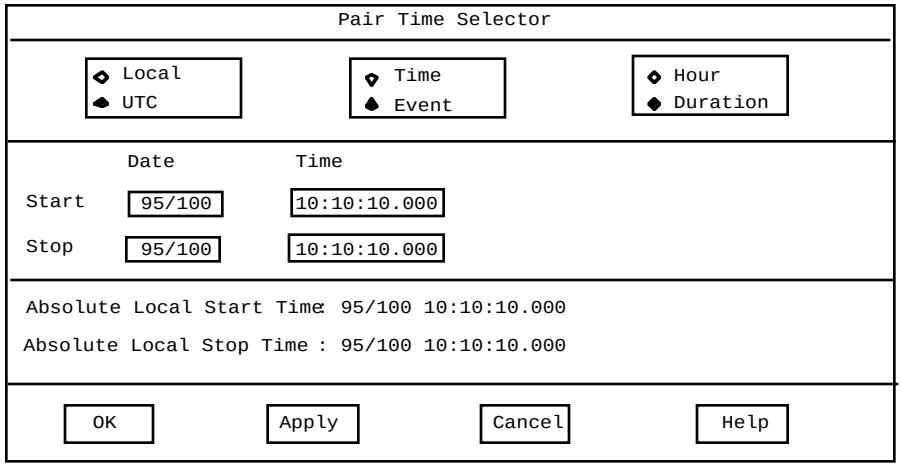

Figure 3.9.7-2. Pair Time Selector

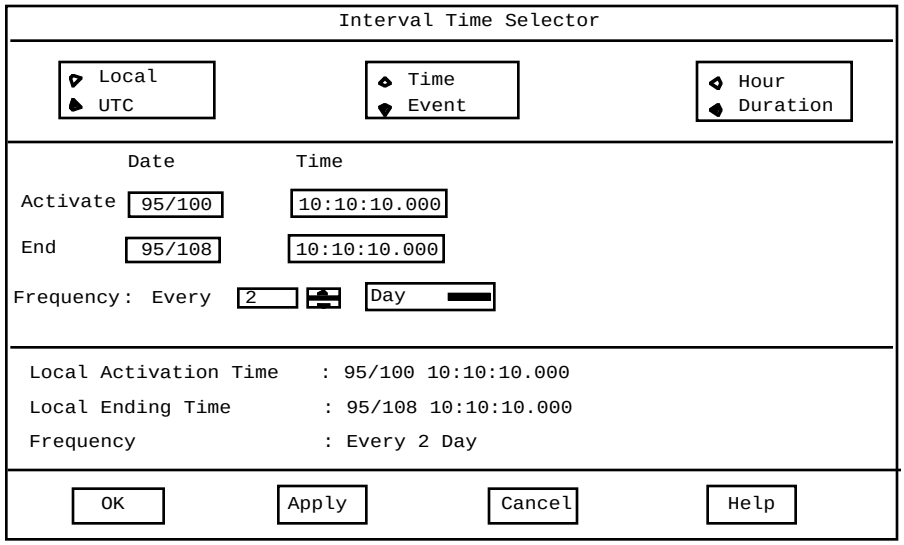

Figure 3.9.7-3. Interval Time Selector

3.9.8 Reports

The Report Selector window allows the user to select the type of report they wish to generate. The user may specify parameters to restrict the types of reports selections displayed. These parameters include:

- **Both, On Demand, Periodic** (radio box) - default value is Both. This radio box controls whether only On Demand or Periodic or Both report types are displayed.
- **Subsystem** (option menu) - default value is All; other options include Custom, Analysis, Command Management, Data Management, Planning & Scheduling, Resource Management, Telemetry and User Interface.
- **Vehicle** (option menu) - default value is AM1; other options include Chemistry and PM1.

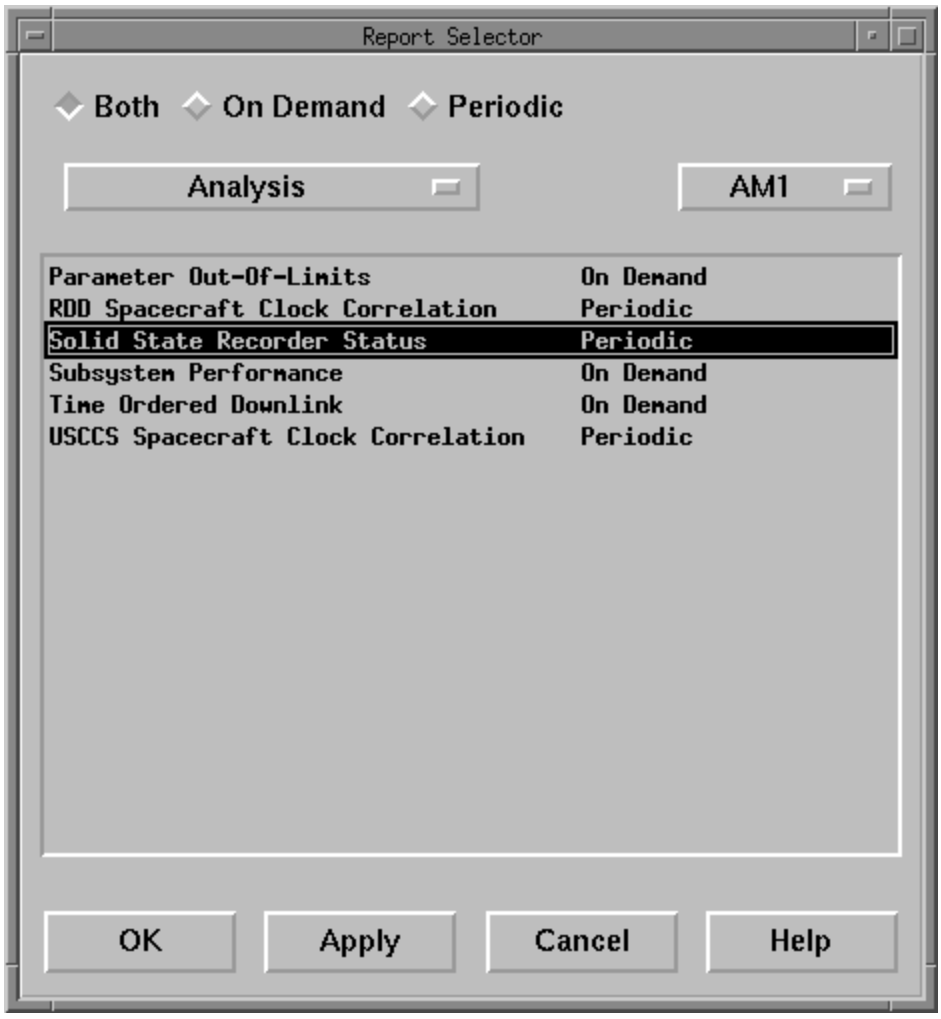

Figure 3.9.8-1. Report Selector Window

The **Available Reports** list is used to select the type of report desired. The available reports are listed alphabetically with a qualifier of either "On Demand" or "Periodic". The user selects the type of report with the mouse and then pushes the **Ok** or **Apply** button at the bottom of the window. This will bring up the select report template dialog box.

Four buttons are located along the bottom of the Report Selector window. The **Ok** button will remove the Report Selector window, and bring up the selected report template dialog box. The **Apply** button will leave up the Report Selector window, and bring up the selected report template dialog box. The **Cancel** button will ignore any selections and remove the Report Selector window. The **Help** button activates a window that provides help information about the Report Selector.

The Periodic Report Selector Dialog (figure 3.9.8-2) may be accessed by any user from the Report Selector window.

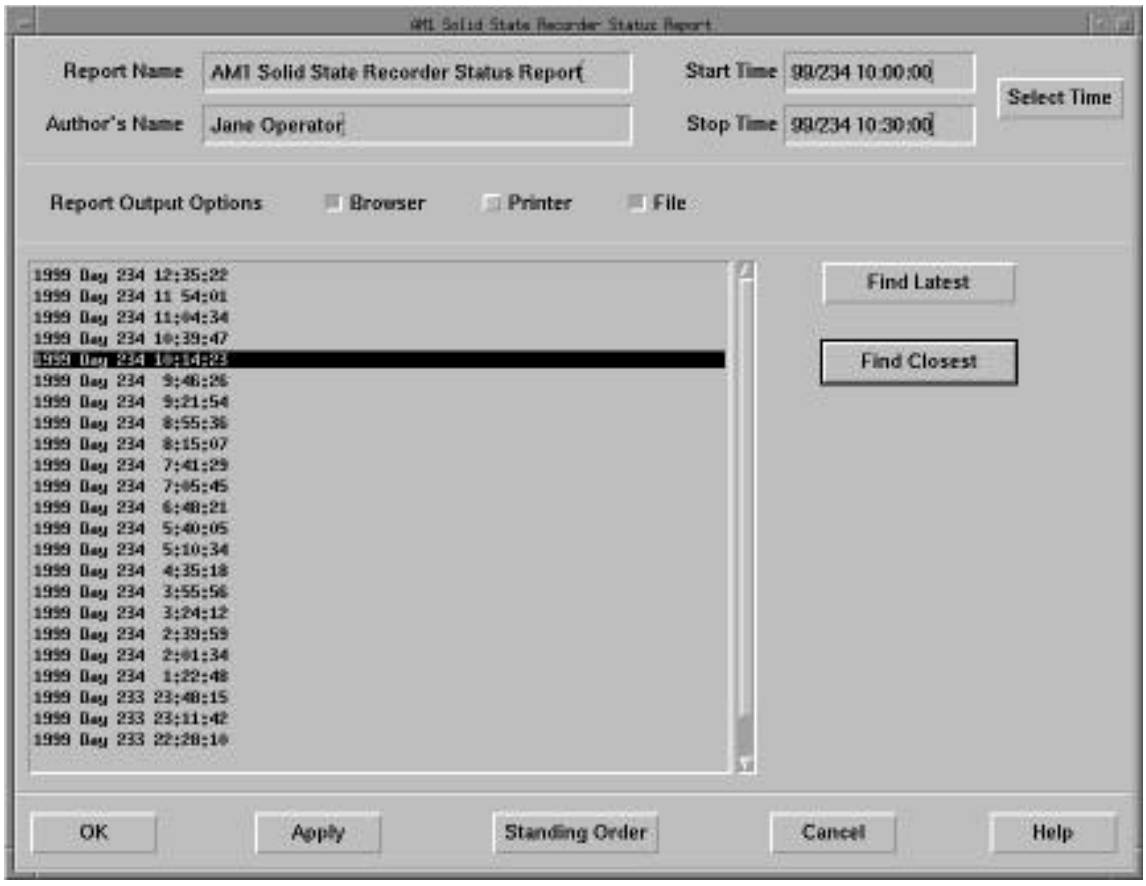

Figure 3.9.8-2. Periodic Report Selector Dialog

The Periodic Report Selector Dialog allows the user to select the periodic report they wish. The dialog is used to build a template which is used by the report generator to retrieve the periodic report. The user can specify parameters which are used by the report generator. The user may also pass this template on to the standing order manager. These parameters include:

- **Report Name** (text field) - The name of the report (automatically filled in).
- **Author's Name** (text field) - The author of this report template (automatically filled in).
- **Start Time** (text field) - The earliest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Stop Time** (text field) - The latest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Browser** (toggle button) - Generate the report and display it in the Report Browser.
- **Printer** (toggle button) - Generate the report and send it to the printer.
- **Browser** (toggle button) - Generate the report and save it to a file.

The **Available Reports** list is used to select the periodic report desired. The available reports are listed in descending chronological order. The user selects the periodic report with the mouse and then pushes the **Ok** or **Apply** button at the bottom of the window. This will generate a report template and pass it to the Report Generator, or the Standing Order Manager in the case of Standing Orders. The **Find Latest** button automatically selects the latest report. The **Find Closest** button automatically selects the report closest to the specified start/stop time period.

Five buttons are located along the bottom of the Periodic Report Selector Dialog. The **Ok** button will remove the Periodic Report Selector Dialog, and pass on the report template for processing. The **Apply** button will leave up the Periodic Report Selector Dialog, and pass on the report template for processing. The **Standing Order** button will bring up the Standing Order Dialog and allow the user to turn the current report template into a Standing Order. The **Cancel** button will ignore any selections and remove the Periodic Report Selector Dialog. The **Help** button activates a window that provides help information about the Periodic Report Selector Dialog.

The On Demand Report Selector Dialog (Figure 3.9.8-3) is used to generate an On Demand report such as the Parameter Out-Of-Limits Report. The On Demand Report Selector Dialog may be accessed by any user from the Report Selector window .

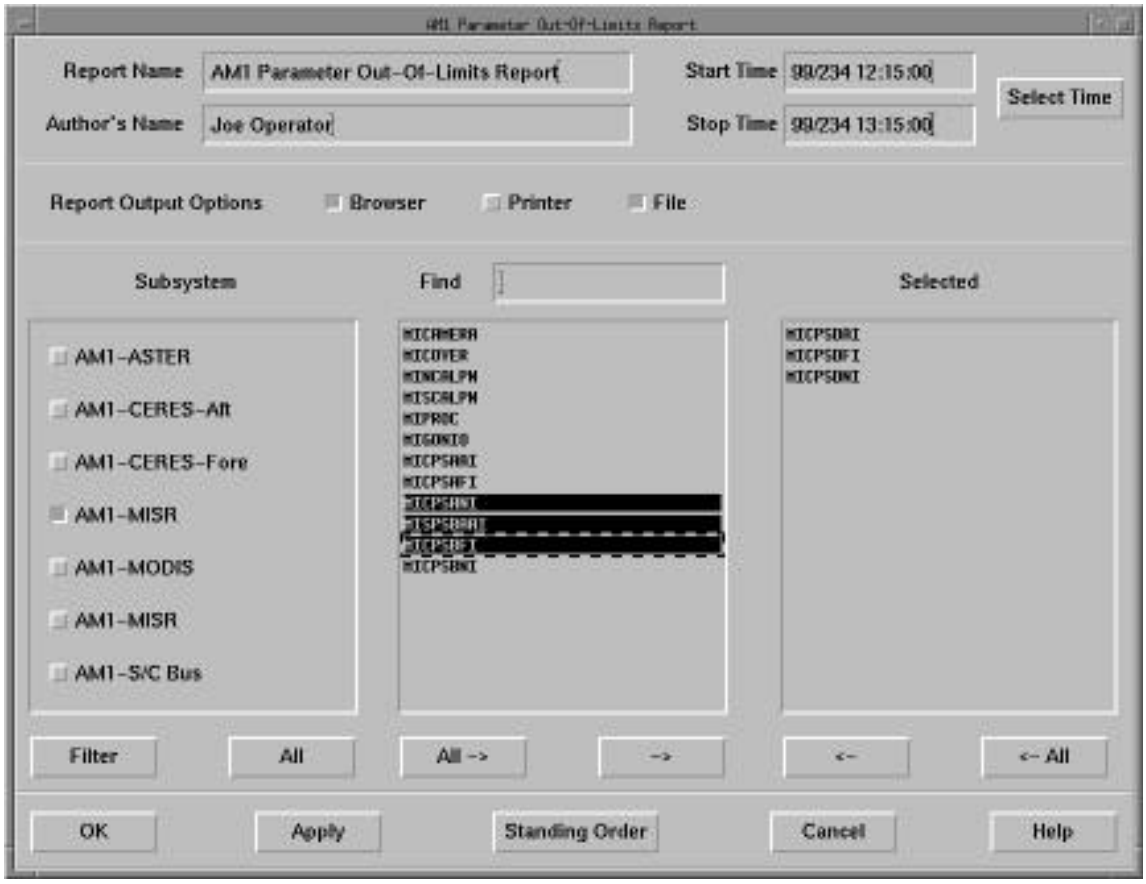

Figure 3.9.8-3. On Demand Report Selector Dialog

The On Demand Report Selector Dialog allows the user to specify the data required for the on demand report they wish. The dialog is used to build a template which is used by the report generator to generate the on demand report. The user can specify parameters which are used by the report generator. The user may also pass this template on to the standing order manager. These parameters include:

- **Report Name** (text field) - The name of the report (automatically filled in).
- **Author's Name** (text field) - The author of this report template (automatically filled in).
- **Start Time** (text field) - The earliest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Stop Time** (text field) - The latest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Browser** (toggle button) - Generate the report and display it in the Report Browser.
- **Printer** (toggle button) - Generate the report and send it to the printer.
- **Browser** (toggle button) - Generate the report and save it to a file.

The Parameter Out-Of-Limits Report is an example of an on demand report. There will be at least 30 different on demand reports available. Each will have a unique dialog. In the case of the Parameter Out-Of-Limits Report, the user is required to specify the period of time of interest as well as the parameters of interest. The parameters are selected using a standard subsystem filter along with a double scrolling list selector.

Five buttons are located along the bottom of the On Demand Report Selector Dialog. The **Ok** button will remove the On Demand Report Selector Dialog, and pass on the report template for processing. The **Apply** button will leave up the On Demand Report Selector Dialog, and pass on the report template for processing. The **Standing Order** button will bring up the Standing Order Dialog and allow the user to turn the current report template into a Standing Order. The **Cancel** button will ignore any selections and remove the On Demand Report Selector Dialog. The **Help** button activates a window that provides help information about the On Demand Report Selector Dialog.

The Custom Report Dialog (Figure 3.9.8-4) is used to generate a custom report. The Custom Report Dialog may be accessed by any user from the Report Selector window.

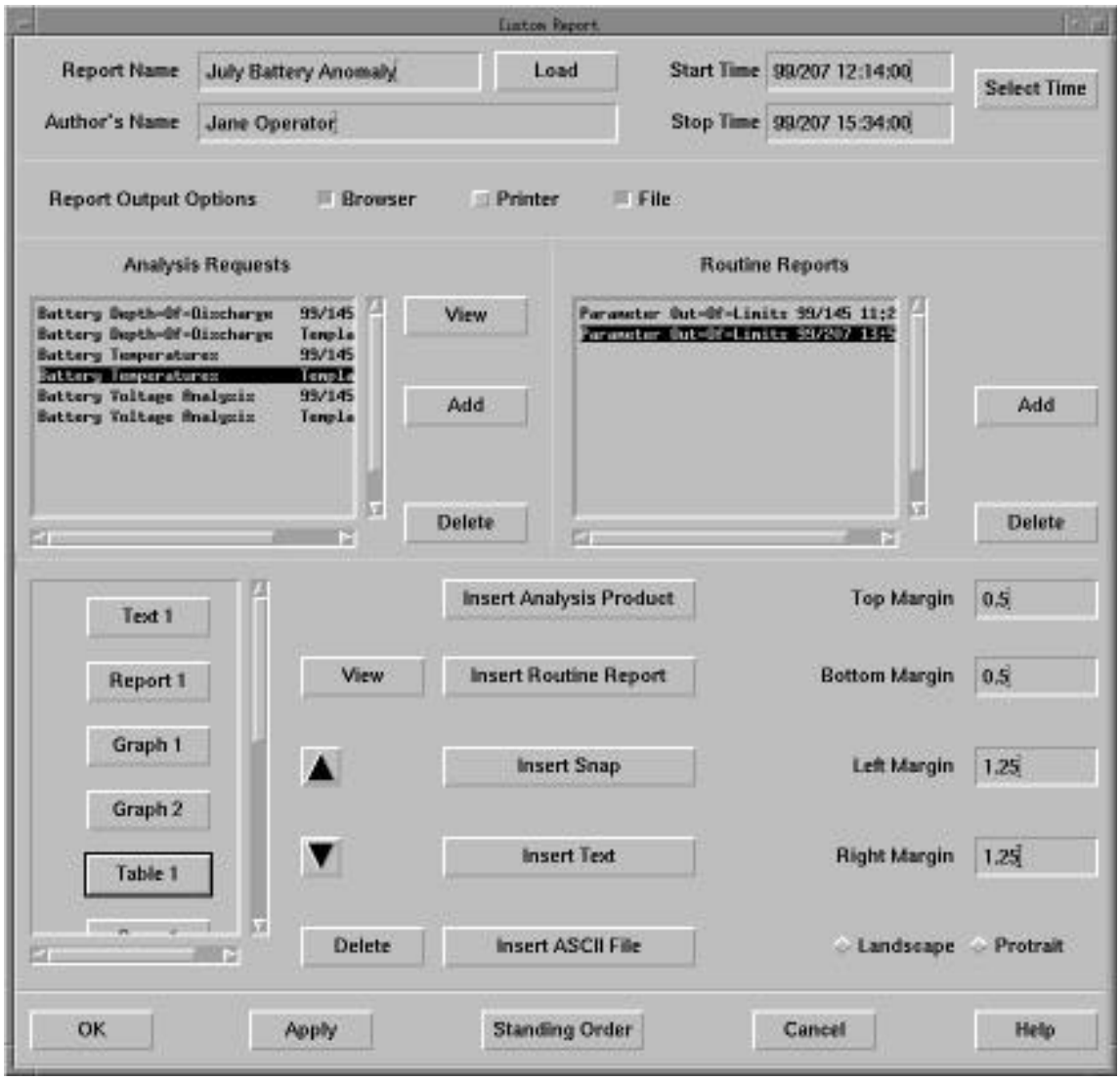

Figure 3.9.8-4. Custom Report Dialog

The Custom Report Dialog allows the user to define the contents of a custom report. The dialog is used to build a template which is used by the report generator to generate the custom report. The user can specify parameters which are used by the report generator. The user may also pass this template on to the standing order manager. These parameters include:

- **Report Name** (text field) - The name of the report (automatically filled in).
- **Load** (push button) - Load an existing custom report template for editing (brings up a file selector dialog).
- **Author's Name** (text field) - The author of this report template (automatically filled in).

- **Start Time** (text field) - The earliest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Stop Time** (text field) - The latest periodic report the user is interested in (optional for normal requests, required for standing orders). The user may use the **Select Time** button to bring up the time selector to assist in filling in the start and stop times.
- **Browser** (toggle button) - Generate the report and display it in the Report Browser.
- **Printer** (toggle button) - Generate the report and send it to the printer.
- **Browser** (toggle button) - Generate the report and save it to a file.

A custom report can be a collection of analysis products (graphs, tables), routine reports, page snaps, free form text and ASCII files. The user defines which items should be placed in the report and in what order. Towards this end, the Custom Report Dialog has two center sections. The first allows a user to analysis request products or reports are available to be inserted into the report. The second area allows the user to define the contents of the report. The Analysis Requests area is composed of the following items:

- **Analysis Requests** (single select scrolling list) - List of available analysis request templates and products the user wishes to insert into the report.
- **View** (push button) - View the selected analysis request in the Analysis Request Window.
- **Add** (push button) - Add analysis request templates and products to the available list (brings up a selection dialog).
- **Delete** (push button) - Delete the currently selected analysis request.

The Routine Reports area is composed of the following items:

- **Add** (push button) - Add routine reports to the available list (brings up a selection dialog).
- **Delete** (push button) - Delete the currently selected routine report.

The report composition area is composed of the following items:

- **Report Layout** (single select scrolling window) - List of push buttons representing the current layout of the report. Every time a new item is added to the report, a button is added to the bottom of the scrolling window. The user may select an item (push a button) and modify the margin and orientation attributes.
- **View** (push button) - View the selected item in the report browser.
- **Up Arrow** (push button) - Move the selected item up one place.
- **Down Arrow** (push button) - Move the selected item down one place.
- **Delete** (push button) - Delete the currently selected item.
- **Insert Analysis Product** (push button) - Insert an analysis product. This brings up selection dialog with all of the products associated with the specified analysis requests.

- **Insert Routine Report** (push button) - Insert a routine report. This brings up selection dialog with all of the products associated with the specified routine reports.
- **Insert Snap** (push button) - Insert a page snap. This brings up selection dialog with all of the user's page snaps.
- **Insert Text** (push button) - Insert free form text. This brings a simple editor into which the user enters the text.
- **Insert ASCII File** (push button) - Insert an ASCII file. This brings up file selection dialog.
- **Top Margin** (text field) - Item's top margin in inches.
- **Bottom Margin** (text field) - Item's bottom margin in inches.
- **Left Margin** (text field) - Item's left margin in inches.
- **Right Margin** (text field) - Item's right margin in inches.
- **Orientation** (radio box) - Item's orientation. This can be either landscape or portrait.

Five buttons are located along the bottom of the Custom Report Dialog. The **Ok** button will remove the Custom Report Dialog, and pass on the report template for processing. The **Apply** button will leave up the Custom Report Dialog, and pass on the report template for processing. The **Standing Order** button will bring up the Standing Order Dialog and allow the user to turn the current report template into a Standing Order. The **Cancel** button will ignore any selections and remove the Custom Report Dialog. The **Help** button activates a window that provides help information about the Custom Report Dialog.

The Report Browser Dialog (Figure 3.9.8-5) is used to browse and edit reports. The Report Browser Dialog may be accessed by any user from the Tools menu located on the Control window.

The Report Browser Dialog allows the user to browse or edit a previously generated report. The Report Browser Dialog is composed of the following parts:

- **Report Types** (option menu) - default value is All; other options include Custom, On Demand and Periodic.
- **Available Reports** (single select scrolling list) - A list of all the reports that have been generated by the user. The reports are listed alphabetically by type and are also tagged with their report type (custom, on demand or periodic).
- **Edit Report** (push button) - Edit or browse the currently selected report.
- **Report Selector** (push button) - Bring up the Report Selector Dialog.
- **Report Name** (uneditable text field) - The name of the currently selected report .
- **Author's Name** (uneditable text field) - The author of the currently selected report.
- **Start Time** (uneditable text field) - The start time of the currently selected report.
- **Stop Time** (uneditable text field) - The stop time of the currently selected report.

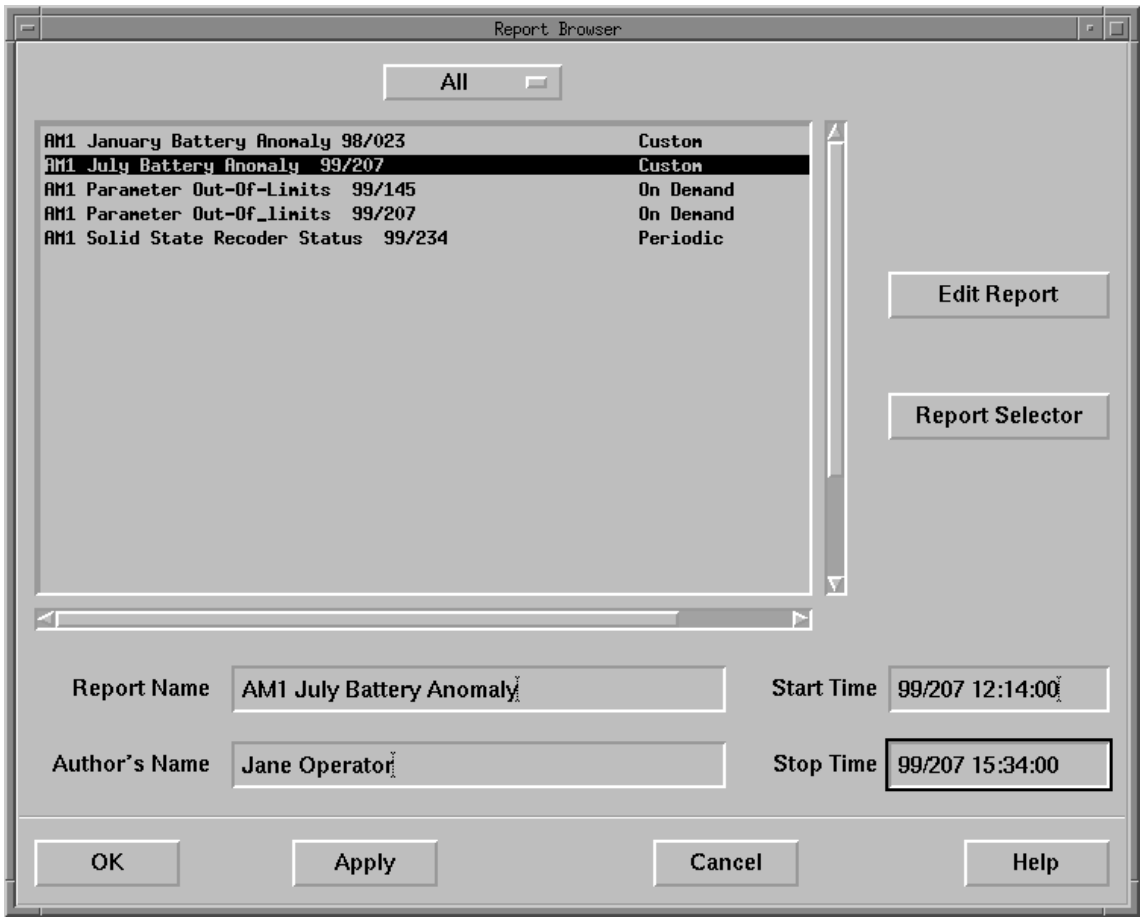

Figure 3.9.8-5. Report Browser Dialog

Four buttons are located along the bottom of the Report Browser Dialog. The **Ok** button will remove the Report Browser Dialog, and pass on the report template for processing. The **Apply** button will leave up the Report Browser Dialog, and pass on the report template for processing. The **Cancel** button will ignore any selections and remove the Report Browser Dialog. The **Help** button activates a window that provides help information about the Report Browser Dialog.

4. Interfaces

4.1 SCF to IST Interface

The SCF to IST interface consists of ingesting memory loads and performing instrument database updates.

Transferring Load Contents to the FOS is discussed in section 3.3.4. Microprocessor Load File Formats are discussed in Appendix B.

Instrument Data Base (IDB) updates procedures are delineated in section 3.8.

4.2 IST to SCF Interface

The IST to SCF Interface consists of Microprocessor Memory Dump (MMD) Processing and Carry-Out data files, and reports.

MMD Processing is discussed in section 3.3.7.

Carry-Out data files are discussed in section 3.5.3. The carry-out data file format is listed in Appendix A.

Reports are discussed in section 3.9.8.

CMS Reports are discussed in section 3.3.8.

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5. Security

The security objective for ISTs is to prevent unauthorized users from masquerading as legitimate users and/or tampering with transmissions from the IST to the EOC. Data confidentiality is not considered a problem. The IST data coming from the EOC to the IST is not classified or unreleasable, therefore there will be no special protection of that data. To protect the EOC from unauthorized access, the following measures will be put in place:

- User Authentication
- Encryption
- Pause Screen

The IST will have a user logon screen to authenticate users. User names and passwords will be processed by CSMS using a Kerberos based software solution. Once a user has been authenticated the user can request that the IST be placed in Management Mode. The IST will check the user name against a PI/TL provided list of users granted that privilege. Only the PI/TL may submit the authorized users list and the Management Mode privileged users list.

Data coming from the IST to the EOC will be encrypted at the IST and decrypted once it reaches the EOC. This is to guard against network hackers "sniffing" the messages going into the EOC so that they could masquerade as a legitimate IST user. It also guards against those messages being altered as they pass through the networks.

To guard against a connected IST user leaving his terminal and an unauthorized person subsequently using that connected IST, a pause screen with a password capability will be available. The IST users must be diligent in using this screen so that they never leave their IST connected and unattended.

Additionally, all file transfers between the EOC and the ISTs will use KFTP (Kerorized FTP). KFTP provides a high level of security via Kerberos authentication. The overhead associated with KFTP is negligible for this application. KFTP will be used for all FOS interfaces; no FTP will be used.

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6. Specifications

The following specifications are preliminary and subject to change. It is assumed that the IOTs do not need the IST (partial functionality) earlier than the EOC Compatibility Test, 5/97. Partial delivery of the IST functionality will occur in 1/97. Final IST delivery (full functionality) will be with Release B in 9/97.

6.1 Preliminary Hardware Specifications

- Unix Workstation (SUN, HP, DEC, SGI, IBM)
- Mid range CPU (e.g., SparcStation 20)
- 19" color monitor (1280 x 1024)
- 64 meg memory
- 6 gig hard disk
- ethernet card
- 4mm DAT tape drive

6.2 Preliminary List of COTS Products

- Motif/X-Windows (latest version)
- DCE
- ECS provided SyBase Client
- HTML Browser (NETSCAPE or MOSAIC, decision not final)
- ECS provided Kerberos software (no cost to PI/TL)
- TCP/IP software

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Appendix A. Carry Out File Format

Carry Out Data File Format. File is ASCII. All record items are delimited by a '|'. All records are delimited by a <CR>.

Item Number	Item Description	Data Type	Maximum Size	Range of Values
	Header			
H1	Number of Records	16 bit integer	5 bytes	All
H2	Time of First Parameter, String of the form YYYY/DDD/HH:MM:SS.MSEC	String	21 bytes	Valid mission times
	Header Record			
H3	Parameter Mnemonic	String	32 bytes	All Valid Mnemonics
H4	Parameter ID	16 bit integer	5 bytes	0 - 65536
H5	EU Data Type R = Real I = Integer S = String (eg. Discrete State String)	Character	1 byte	all allowed data types
	End Header Record Repeat for each parameter.			
	Data Records			
D1	Time of Parameter, Offset from start time of first parameter in seconds	Real (8 bytes)	16 bytes	All
D2	ParameterID	16 bit integer	5 bytes	All
D3	Raw Value	integer	10 bytes	All
D4	Converted Value	Variable. See item H5	16 bytes	Variable
D5	Decoded Value	32 bit integer	10 bytes	All

Item Number	Item Description	Data Type	Maximum Size	Range of Values
D6	Status Flags The bits in the Status Word are arranged as follows:(Bit 0 is the LSB): Bit 0 RedHi Bit 1 RedLow Bit 2 YellowHi Bit 3 YellowLow Bit 4 Delta Limit Bit 5 Rail Limit Bit 6 Quality Bit 7 EU Conversion Valid Bit 8 Conversion Error Bit 9 Invalid Parameter	32 bit int	10 bytes	All
	End Data Record.(End Line)			
Repeat D1 - D6 until EOF				

Example:

3 ; number of header records

1997/234/19:23:43.024 ; time of first parameter

MPSEMISA1|23|R ; header record 1

MPSEMISA2|24|R ; header record 2

MPSEPMONOUT2|3456|I ; Last Header Record. Rest of file is Data.

0.0|23|029|23.5676||0 ; this is a parameter with no decoded value, but with a converted value

0.001|24|099|83.5676||4

0.052|23|029|23.5676||0

0.055|24|089|80.5676||4

1.000|3456|4294967295||-1|0 ; this is a parameter with no converted value but with a decoded value

etc...

Appendix B. Microprocessor Load File Format

All microprocessor load contents files transferred to the EOC are manipulated by the EOC prior to uplink to the spacecraft. Microprocessor load contents files contain binary data formatted as 1553B commands, as shown in ICD-106 (Martin Marietta Corporation, Interface Control Document (ICD) Data Format Control Book for EOS-AM Spacecraft), Figure 17. The EOC reformats the commands according to the CCSDS telecommand packet protocols as specified in ICD-106.

The binary microprocessor load data must be presented by the SCF in a format that is consistent with the structure and word/bit order identified in ICD-106, Figure 17. The file must consist of the "Load Initiate Command," followed by *n* "Load Data Commands." If there is a maximum number of 16-bit words that may be uplinked to the instrument, the load contents files provided by the SCF must not exceed that size limit. Loads that exceed the size limit must be transferred to the EOC in multiple files.

Binary microprocessor load contents files adhere to the following naming convention:

AM1_MPR_iiiii_aaaaaaaaaaaaaaaaaaaaaaaaaaaaaa_pp_OF_nn.CNT

where:

- "iiiii" is a 4 or 5 character instrument identifier
- "aaaaaaaaaaaaaaaaaaaaaaaaaaaa" is a user-supplied text identifying the load and having a maximum length of 30 characters
- "pp" is a partition number specifying the relative position of this file in a multi-file load
- "nn" is the total number of load contents files making up this load

example:

AM-1_MPR_CERES_ICP_PATCH02_01_OF_01.CNT

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Abbreviations and Acronyms

ATC	Absolute Time Command
BAP	Baseline Activity Profile
CAC	Command Activity Controller
CCB	Configuration Control Board
CDR	Critical Design Review
CDRL	Contract Data Requirements List
COTS	Commercial Off-The-Shelf
CSMS	Communications and System Management Segment
DAAC	Distributed Active Archive Center
DBA	Database Administrator
DFCD	Data Flow Control Document
DMS	Data Management Subsystem
ECL	ECS Command Language
ECS	EOSDIS Core System
EOC	ECS Operations Center
EOS	Earth Observing System
EPS	Encapsulated PostScript
EU	Engineering Unit
FDF	Flight Dynamics Facility
FOS	Flight Operations Segment
FOT	Flight Operations Team
FUI	FOS User Interface
HTML	HyperText Meta Language
ICC	Instrument Control Center
IDB	Instrument Data Base
IOT	Instrument Operations Team
IST	Instrument Support Toolkit
MMD	Microprocessor Memory Dumps

MML	Microprocessor Memory Loads
MMM	Min, Max & Mean Statistics
NCC	Network Control Center
ODB	Operational Data Base
PDB	Project Data Base
PDF	Publisher's Display Format
PI/TL	Principle Investigator/Team Leader
P&S	Planning and Scheduling
RID	Review Item Disposition
RTS	Relative Time Sequence
SCF	Science Computing Facility
SDR	System Design Review
TDRSS	Tracking and Data Relay Satellite System
UTC	Universal Time Coordinated